

May 27, 1998

Mr. Ben Wopat
U.S. Army Corps of Engineers
St. Paul District, 190 Fifth Street East
St. Paul, MN 55101-1638

RE: Comments on the Work Plan for Characterization of Depyritized Tailings and Paste Backfill
for the Crandon Mine Project; 94-01298-IP-DLB

Dear Mr. Wopat:

For your records, the following is a reiteration and expansion of several comments made by the U.S. Environmental Protection Agency (EPA) and by others at the May 22, 1998 meeting held in Rhineland, WI regarding the above referenced subject. Char Hauger and Jon Ahlness were in attendance at that meeting representing the Corps of Engineers (COE).

I believe that if the depyritizing of the tailings can work, it will be an overall benefit to the project by further stabilizing the acid mine drainage producing waste within the backfill of the mine instead of within the Tailings Management Area (TMA). One of my concerns was just how representative of the 44 million tons of expected tailings is the several hundred grams of tailing samples that produced the pyrite removal test results used by Nicolet Minerals Co. (NMC) in this report? NMC responded that the tailings used for the analysis was a composite made to represent tailings from the overall orebody. I understand that only a limited amount of core samples/created tailings are available for further testing, but should this limit the amount of testing needed to adequately statistically represent the tailings in determining overall tailings characteristics and efficiency of pyrite removal?

Another concern regarding the relatively high percent (30.2%) of pyrite within this ore that potentially could be removed was that if at that percentage, would the removed pyrite be marketable? I provided NMC, COE and the Wisconsin Department of Natural Resources (WDNR) a report regarding a site (Superior Mine in Arizona) at which the ore body contained as much as 25% pyrite and the mining company was able to market the pyrite. This occurred in the early 1980's so the market may be much different now. NMC did respond by stating that they are looking into this option for the removed pyrite, but it does not look likely. The WDNR is also looking into this alternative for the pyrite as it is a requirement under their state code to analyze the possibility of reuse of waste products whenever feasible.

A third concern was related to Table 2.1 within the Workplan. At the meeting, Mr. John Chapman, an NMC consultant, stated that according to this table, the depyritized tailings not only decrease in sulfur content, but also trace metals also are removed. I had questioned the

arsenic results in that it appears that what is lost within the depyritized tailings is not gained within the backfill tailings, or that arsenic appears to be lost or consumed in the process. Mr. Chapman explained that the results presented within Table 2.1 are from two different samples. The Fresh Fine and Coarse Tailings samples were not the same samples used for the pyrite removal tests, so that the lose/gain of individual elements may not add up. While this may have answered the initial concern, an additional concern of how can NMC then measure the efficiency of pyrite/trace metal removal if they do not know what their sample contained prior to removal, but used base levels from a completely different test? In a conversation with Mr. Chapman after the meeting, he did state that they did have the needed data and will revise the table.

Another concern was regarding a statement within the workplan (Section 2.3 - 4th paragraph) regarding the pyritic paste backfill that states, "However, other differences are small enough that significant changes in the overall rate of oxidation and the relative release rates of trace metals are not expected". I asked how will this statement be affected if the grouting program is successful and used for this project, therefore prolonging the amount of time that the completed mine would be reflooded and causing more exposure time for the waste to the oxygen within the mine? Mr. Chapman responded that while it is true that reflooding will take longer, depending on the success of the grouting program, that once the mine is shut down, the ventilation will also be turned off, and the oxygen present within the mine will be consumed very quickly and further oxidation will cease. This issue needs to be addressed further by NMC.

A final concern, brought up by other parties, but shared by EPA, is that the workplan did not adequately explain the process in which the pyrite would be removed from the tailings. What chemicals and in what quantities will they be needed, in addition to the chemicals already needed for floatation of the ore? Where and how will these be stored? What additional wastes will be included in the waste stream to be disposed of within the TMA? Are the synthetic liners proposed for the TMA compatible with the additional waste components? Will the concentration of the pyritic material add combustion concerns to the backfilled waste?

With all the above concerns and the many other changes proposed for the project, EPA recommends that once NMC elects to finalize their overall approach to the project, that COE requests NMC to provide new, updated versions of the Mine Permit Application and of the Environmental Impact Report (at least Volumes I and II of the EIR) and to not just replace pages as has been done throughout the last several years.

If you have any questions regarding any of the above, please do not hesitate to call me at 312-886-7252.

Sincerely,

Daniel J. Cozza, Crandon Mine Project Manager
U.S. Environmental Protection Agency

cc:

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